

AeRobiology: the computational tool for biological data in the air

Antonio Picornell *¹, Jose Oteros², Jesus Rojo^{2,3}

¹ University of Malaga – Campus de Teatinos, Spain

² Center of Allergy & Environment (ZAUM) – Germany

³ University of Castilla La Mancha – Spain

Aerobiology databases are constantly growing. Managing these extensive datasets requires large amounts of time and effort. Nevertheless, publication and dissemination of the scientific findings demand quick and elaborated results, which have led to integrate computational techniques in almost all scientific fields. "AeRobiology" is a new computational package implemented for R software which has been designed to automatically manage and visualise aerobiological data. It is an open access package and completely free to use.

"AeRobiology" package has 14 different functions which can be structured according to their utility: (1) checking the quality of the data, (2) data analysis and (3) visualization of results. Some of these functions allows to: interpolate missing gaps within the database with different techniques, calculate the main parameters of the pollen season according to all the existing Main Pollen Season definitions (percentages, logistic method, number of days with a certain amount of pollen grains in a given period of time, clinical methods, and a new one proposed by the authors based on the application of a moving average to the pollen series exceeding a pollen threshold), elaborate pollen calendars, detect and measure trends in the main seasonal indexes, visualise the relative abundance of the different particles detected in the air, compare different years or different types of aerosols, visualise phenological parameters, and elaborate interactive plots for interpreting results on real time. More detailed information about each function can be consulted at:

<https://cran.r-project.org/web/packages/AeRobiology/AeRobiology.pdf>

This new computational tool, which is already available at CRAN repository, could constitute a useful tool to the scientific field of aerobiology. It can reduce the time and effort of the data analysis even for researches who are not very familiar with programming languages. Furthermore, it could be a necessary tool to manage the real-time data from the new automatic sampling devices.

*Speaker